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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,570	06/08/2001	Chandrika Kamath	IL-10714	1692

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EXAMINER	
AMSBURY, WAYNE P	
ART UNIT	**PAPER NUMBER**
2161	

DATE MAILED: 11/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/877,570	KAMATH ET AL.	
	Examiner	Art Unit	
	Wayne Amsbury	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-17,19-26 and 28-35* is/are rejected.

7)☒ Claim(s) *9,18,27 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

CLAIMS 1-36 ARE PENDING

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. **Applicant's arguments filed 6/29/04 have been fully considered but they are not persuasive.**

The arguments appear to be based in large part on amendments to the claims. Using claim 19 as exemplary, the addition of for processing data to a data mining system carries no patentable weight in light of the fact that any data mining system processes data. The addition of: using said multiplicity of processor (sic) is moot on the grounds that the combination of teachings used to reject would inherently do so. The factual inquires set forth in Graham v. Deere are met in the previous rejection and clearly ascertain the differences between the prior art and the claims at issue, but in the interest of compact prosecution, the rejections are restated below in a more explicit format.

It is noted that the motives for combining the applied references in the context of the claims is not disputed. As set forth below, the resulting combination is a modularized, object-oriented decision tree data mining system with parallel classification and parallel sorting, and it applies split tests.

Consequently, the rejections of the previous action are hereby maintained.

3. **The disclosure is objected** to because of the following informalities:

In claim 19 the phrase added by amendment: "multiplicity of processor" should be pluralized.

Appropriate correction is required.

4. **Claims 1-8, 10-17, 19-26 and 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Busche et al (Busche), US 6,430,547 B1, 06 August 2002 in light of Agrawal et al (Agrawal), US 6,230,151 B1, 08 May 2001 in further light of Yamada et al (Yamada), US 5,319,740, 07 June 1994 in further light of Beckerle et al (Beckerle), US 6,311,265, 30 October 2001.**

For the sake of clarity it is noted that the exemplary claim 1 consists of a pattern recognition module comprising two parts and a link. One component is a decision tree with (sub-) modules, and the other is a generic data mining system, with a link between its storage and the decision tree system.

Broader claims, such as claim 19, have similar and more generic limitations.

As to **claim 19**, Busche is a data mining system, as evidenced by TITLE, ABSTRACT, and SUMMARY. The files of Busche include collected geological and remotely sensed samples [SUMMARY].

Features such as chemical properties, location, and hidden relationships are extracted [SUMMARY] and patterns of relationships are determined in Busche.

The features of the samples in Busche are relevant to a better understanding of the geology of a region [COL 1 lines 37-41], but Busche provides a much broader teaching than that.

Busche recognizes a large variety of systems and data types, some plotted in two dimensions [COL 5 lines 64-65, some presented as three-dimensional [COL 6 lines 15-35; FIG 3], some as decision trees [COL 6 lines 60-65], some as text [throughout] including rules.

As noted, the systems of Busche include decision trees [COL 6 lines 60-65], and Busche recognizes the use of parallel processing [COL 9 lines 42-44 and COL 4 lines 50-53].

Busche is clearly modularized [FIG 4].

Objects such as data points, properties, and associated information are identified in the files digitally stored as representations of the samples [COL 1 lines 47-60], and Busche recognizes the use of object-oriented programming systems [COL 3 line 61 to COL 4 line 2], but does not explicitly apply object-oriented modular programming techniques.

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement a decision tree as a system of object-oriented modules, as evidenced by Yamada, because this implementation enables a process step and data to be treated as one object [COL 5 line 67 to COL 6 line 7].

Thus Busche, and Busche in combination with Yamada, provide a strong basis and a broad teaching of the major elements of claim 19, but the combination is not explicit in some additional details as claimed.

The other references are applied to provide evidence of the motivated use these elements in the art at the time of the invention and some explicit teachings and details. As noted above, Busche recognizes the efficacy of parallel processing and the use of decision trees but Busche does not address details of the use of decision trees such as the use of a split test. Yamada, as noted above, teaches the object-oriented implementation of decision trees, but does not explicitly apply a split test.

Agrawal teaches the use of parallel classification for data mining in a multiprocessor system [TITLE; COL 2 lines 61-65, and elsewhere], teaches sorting in parallel [COL 4 lines 47-49], and the application of split tests to allocate processor shares [COL 4 lines 49-53], and is directed to this particular mode of decision trees in data mining. Agrawal does not explicitly address programming techniques such as object-oriented programming and modularity.

Beckerle is directed to (object-oriented) programming of parallel computers, and in particular with partitioning data among multiple computers [ABSTRACT], and in more particular with sorting in parallel [COL 1o line 58 to COL 11 line 20]. **It would have been obvious** to one of ordinary skill in the art at the time of the invention to apply the parallel programming of Beckerle to the operations of Busche because much of the work in this field focuses on the use of parallel processing [Busche COL 9 lines 42-44];

many applications benefit from greater computing power than can be provided by a single computer [Beckerle COL 1 lines 19-35].

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the parallel decision tree data mining of Agrawal with the object-oriented programming techniques of Busche because this would combine a decision-tree classifier that is fast, compact, and scalable on large data sets with the use of object-oriented technology for modularization and organization of large programs.

To the extent that it is not inherent to link a decision management and/or pattern recognition system to the relevant data, Yamada addresses this throughout, as at FIG 17; Busche does so throughout as in FIG 4; Agrawal does so throughout, as at FIG 14 where the leaves contain data of the data mining system.

As to **claim 20**, Agrawal applies a variety of split tests [COL 4 line 47 and after], including splitting based on a numerical attribute [COL 4 line 65 and thereafter]. The Specification calls this a feature of "traditional decision trees" [page 17].

As to **claims 21-26**, the use of a Gini index, the CART-LC and the OC1 algorithms were well known at the time of the invention, as evidenced in the Specification at pages 14 and 18-20. As noted in the Specification on page 16, Quinlan suggested the use of the Information Gain Ratio as an improvement on Information Gain.

[As to **claim 24**, also see Agrawal COL 5 lines 6-8.] The Specification at page 20 **[0053]** teaches that evolutionary algorithms are well known.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply well known splitting algorithms because this is more efficient than generating and debugging a new splitting rule.

The elements of **claims 1-8, 10-17, 28-35** are rejected in the analysis above and these claims are rejected on that basis.

5. **Claims 9, 18, 27 and 36** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to anticipate or teach the application of the twoing rule [Specification page 15] to parallel decision tree splitting in an object-oriented data mining paradigm.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne Amsbury whose telephone number is 571-272-4015. The examiner can normally be reached on M-F 6-18:30 FIRST WEEK.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 571-272-4023. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WPA

WAYNE AMSBURY
PRIMARY PATENT EXAMINER